Int J Public Health 52 (2007) 275–285
1661-8556/07/050275-11
DOI 10.1007/s00038-007-6067-0

Original article

Use and perception of Internet for health related purposes in Germany: results of a national survey

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Submitted: 16 May 2006; Revised: 14 February, 13 April 2007; Accepted: 16 May 2007

Summary

Objectives: Patient empowerment through the Internet is seen as a chance to improve patient-physician communication. Studies on the prevalence of Internet use for health related purposes and on how patients perceive those technologies are still rare. We therefore studied perception of and trends in health related Internet use.

Methods: As part of a European survey 1.000 German individuals were interviewed using a computer-based telephone interview (CATI: Gabler-Häder-Design, random-digit-dialing, last birthday method) in October 2005. Descriptive statistics and logistic regression models were applied for elaborating characteristics of the health Internet users.

Results: Internet use in general (72.3%) and for health related purposes (53.1%) is already quite high. Its importance, relative to other sources of health related information, was rated rather low. Younger citizens and people with paid work used the Internet more often for health related purposes, nevertheless, assessing it as less important for health related purposes than their counterparts.

Conclusion: Despite booming of Internet use in Germany, consumers still value and use more the traditional sources of health information/communication with their doctors. Follow-up studies with a subsequent survey in 2007 will be pursued.

Key words: Use of internet – Health care information – Nationwide telephone survey – eHealth trends.

Internet is the biggest medical library in the world and is likely to play a key role in future healthcare related communication (Akerkar & Bichile 2004; Hussain et al. 2004). It has transformed the way many health seekers find health information. The number of people using the Internet has exponentially increased in recent years and Internet has become a favoured source to find health information (Ellert et al. 2006). Worldwide, about 4.5 % of all Internet searches are for health related information (Morahan-Martin 2004). Therefore the internet has attracted considerable attention as a potential tool to enhancing patient empowerment (Sadan 2002; Akerkar & Bichile 2004; Graspemo et al. 2005; Fox et al. 2005).

However, despite regular surveys on general Internet use in Germany (TNS Emnid 2006, AG ARD Multimedia 2006), published estimates of the prevalence of the Internet use for general health related purposes are sparse. Studies, set to determine the frequency with which the Internet is used for different specific health related purposes, for a long time have only targeted selected groups of Internet users (e. g. chronically ill persons, female AIDS patients, orthopaedic out-patients of particular clinics) and did not provide estimates for the general population (Cline & Haynes 2001; Diaz & Griffith 2002; Wagner et al. 2004; Jariwala et al. 2004; Gray et al. 2005; Farid 2005). Only recently more comprehensive large scale surveys on such issues have been performed, mainly however, in the US (Baker et al. 2003; Cotten & Gupta 2004; Hesse et al. 2005; Ybarra & Suman 2006) where the use of the Internet for communication between citizens and their health care consumers has also been already explored (Houston et al. 2004). An opinion poll on sources of information about health used by European citizens has been performed in 2002 (European Opinion Research Group 2003).

In Germany, the Robert Koch Institute, which has a long tra-

dition for performing health surveys, has started to implement regular computer assisted telephone surveys in 2002. The issue of information sources for health information and the role of the Internet in this context however, have only been investigated with one question within the 2003 survey (Horch & Wirz 2005). Similarly, other broader surveys in Germany, as the Bertelsmann Gesundheitsmonitor (Bertelsmann-Stiftung 2004) or the German part of the "future patient study" (Dierks & Seidel 2005) have also comprised only restricted analysis of Internet use for health purposes. As to our knowledge, only one earlier study (2001) on the use of the Internet for health care information exists, which has looked at factors that distinguished the online seekers of health information from the other Internet users (Hüfken et al. 2004). Considering the enormous speed of internet deployment, the results of the latter study are today rather outdated. This was motivation for a new survey focusing on frequency, reasons and type of Internet use for health purposes (including online communication with health professionals) and comparing the Internet as an information source also with the traditional information sources. Furthermore the citizens attitudes towards and expectations in such new information and communication media should be investigated. Our study is based on a national survey conducted in Germany in October 2005 as part of a multinational survey which was run concomitantly in seven EU countries (Denmark, Germany, Greece, Latvia, Norway, Poland, Portugal) in the context of the international project "WHO/European survey on ehealth consumer trends" funded by DG Sanco. The managing partner of that project is the National Centre of Telemedicine (Tromso, Norway).

Objectives

This study presented here was set to determine:

– the perception of the Internet as a source of health related information by German healthcare consumers between 15–80 years of age,
– the prevalence of the general Internet use by the German population (age 15–80)
– the prevalence of seeking health related information in the Internet,
– the prevalence of specific health related activities in the German population aged 15–80 seeking health related information in the Internet,
– the prevalence of online communication with healthcare professionals through the Internet (e. g. web portals, e-mail) in the German population aged 15–80,
– the influence of certain demographics on the consumers' perception and use of the Internet for health related purposes.

Methods

Design

The instrument of the survey. The instrument of the survey was a questionnaire developed initially in English by an international group of 20 people with various backgrounds (physicians, sociologists, specialists in medical informatics, psychologists) with proven expertise in eHealth and in questionnaire design. The questionnaire was piloted with 100 individuals to ensure the comprehensibility of the wording and internal validity. The dual focus method involving "translation for meaning" (Erkut et al. 1999) was used within a two days workshop to translate the English questionnaire into German. This translation approach is different from the translation-back translation method in that it focuses also on conceptual equivalence as well as on equivalence in wording and grammar, with the aim to reduce potential cultural bias in the questionnaire.

The questionnaire included topics related to

– the individual profile of the participants:
  • demographic: gender, age
  • social: education, employment, children in the household
  • geographic: urbanisation
  • health status: subjective current health status, presence of chronic illness or disability.
  • In this article all these aspects will be referred to as demographics.
– importance of various sources of information about health or illness
– importance of certain factors in consumer's assessment of a health related website
– importance of certain factors (some related to eHealth, some not) in consumer's choice of a new physician
– internet use: frequency of use and points of access mostly used
– internet use to obtain information on health and illness
  • in general
  • for specific online activities (e.g. to read about health and illness, to order medicines or other products, to participate in forums or self help groups focussing on health and illness)
– feelings experienced as well as specific actions being taken as a result of the health related information acquired through the Internet
– use of the Internet and related technologies to communicate with ones own family physician and reasons for not use.

The complete questionnaire consisted of 21 questions. Some of the above aspects were questioned with answer options on a five point Likert scale (1 stood for not important and 5 for

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Example 1:

I will now read a list of various sources of information about health or illness, and would like to know how important these are to you. Please answer on a scale from 1 to 5, where 1 is ¨not important¨ and 5 is "important¨.
Choices for information sources were "Internet , TV/radio, books/medical encyclopaedias/leaflets, courses/lectures, newspapers/magazines, family/friends/ colleagues, pharmacies and direct face-to-face contact with health professionals"

Example 2:

When evaluating an Internet health site, how important are the following factors (from 1 = not important to 5 = important)**?**
Choices for factors to be questioned were "secure handling of personal information, information in my own language, updated information, interactivity (e.g. question-and-answer), service/discussion groups/chat, health professionals are involved, clearly stated who is responsible for or sponsors the site"

Figure 1 Examples of questions with ratings based on a 5 point Likert scale

important). Exemplarily, two of the questions are shown in Figure 1.
In this article we report on the perception of the Internet as a source for health related information, the use of the Internet for health related purposes (acquisition of health related information and communication with healthcare professionals) and will examine the influence of the demographics on these aspects.

The administration of the instrument. The resulting questionnaire was administered by a German poll agency (Field Facts Germany) during computer assisted telephone interviews (CATIs) which were conducted in a two week period starting on October 11th 2005. The phone numbers used to recruit the participants were derived from a national random digit dial telephone sample which was drawn from personal telephone numbers (both fixed lines and cell phones) using an equal probability selection method.
The survey aimed at the German population between ages 15 and 80, living in a private household. The person to be questioned within the respective household was selected based on the „last-birthday-method" (Salmon & Nichols 1983). The average length of an interview was 13 minutes.

Population
From the records of the 1,000 subjects who were surveyed via computer-assisted telephone interviews (CATIs), a sample of 975 valid and completed records were drawn for the statistical analysis. Except for one subquestion (which had 5.2 % missing data) no variables had more than 5 % missing data. To ensure representativeness for the German population between 15 and 80 years of age, the sample was compared to the most recent German national micro-census data (Statistisches Bundesamt Deutschland 2004). To correct for minor discrepancies between the sample data and the census data design weight for age, gender and education was employed. Frequencies presented below (in Table 2, 3 and 5) are based on the weighted data.

Analysis
For statistical analysis the demographic categories were dichotomised as described in table 1. Citizens with the age between 15 and 44 were classified as younger citizens (which might be more open to computer technologies, since they should have had the opportunity to be already confronted with computers during their school/university education), between 45 and 80 as older ones. Additionally, this separates the population close to the mean age. All education levels up to high school were grouped as lower education; long and very long cycle higher education comprised university education and were categorized as higher education. In terms of the number of children living within ones household we differentiated between persons without any children and citizens with at least one child. Urbanisation was split between rural areas/villages and smaller cities/main cities and in terms of a citizens subjective health status we differentiated between feeling healthy (good, very good) or not healthy (fair, bad, very bad). We evaluated the influence of the demographic categories by additive multiple logistic regression. Possible interaction terms of the demographic categories were assessed by a stepwise variable selection procedure. We used a classification tree to illustrate an underlying model for internet use and multiple box plots to compare the importance of different sources of health information.
SPSS version 13.0 and R (R Development Core Team 2006) were used for analysis.

Variable	Group 1	Group 2
Age	Younger citizens (age 15–44)	Older citizens (age 45–80)
School education	Higher education: – long cycle higher education – very long cycle higher education	Lower education: – basic school up to 7 years – basic school 8–10 years – secondary school
Children in household	At least one child	No children
Urbanisation	urban – main city (>100,000 inhabitants) – small city (20,000–100,000 inhab.)	rural – villages (10,000–20,000 inhab.) – rural area (<10,000 inhabitants)
Occupation	paid work	Without paid work – in education, unemployed, retired and others
Subjective health status	Subjective present state of health – very good – good	Subjective present state of health – fair – bad – very bad
Internet user	Internet usage – every day, week, month, and less than once a month	Internet usage – never
Internet use for health related purpose	Health related internet usage – every day, week, month, six months, year and less than once a year	Health related internet usage – never
Importance of Internet as information source for health related purpose	Important – strongly agree – agree – neither agree nor disagree	Not important – disagree – strongly disagree

Table 1 Dichotomisation of the demographic variables and the Internet for health related use variables

Results

The composition of the sample is summarized in Table 2.

From our sample 72.3 % of the subjects did already use the internet. Within the past month most of them had accessed it from home (59 %) or from their office/school (32.5 %). Compared to this, access from friends/family (5.8 %) an internet café (4.9 %), a healthcare institution (0.3 %) or any other location (0.6 %) was much lower. The majority used it on a monthly basis (24.4 % of the Internet users) or about every six month (22.2 % of the Internet users). Table 3 shows the frequencies of health related Internet use as percentages from the complete sample and from the Internet users respectively. 53.1 % of the entire sample (73.5 % of the Internet users) had reported using the Internet for health related purposes.

Of all the demographic factors considered (gender, chronic illness and as listed in Table 1) in an additive logistic regression model occupation ($p < 0.001$), people with education higher than high school ($p = 0.01$), people living in cities ($p = 0.01$) and with long-term illness ($p = 0.01$), had an increased frequency of using the Internet for health related purposes and the age group 45–80 ($p < 0.001$) a decreased frequency, compared with their counterparts (Table 4a: main effects model). Moreover, occupation ($p = 0.03$) had a significant reducing impact and the age group 45–80 ($p < 0.001$) had an increasing impact on the assessment of the importance of Internet use for health related purposes, compared with their counterparts (Table 4b: main effects model).

In additional questions, Internet health users were asked to further specify the type of online activities they had performed. Table 5 shows, that looking up health information after an appointment with health professionals (e. g. for second opinion) was the most common health related Internet activity (66.2 % of health Internet users), directly followed by looking for information in order to decide whether to consult a healthcare professional (65.0 %) or reading about health/illness in general (61.3 %). Interacting with health professionals one had not met face-to-face (54.2 %), searching for health related information prior to a doctor´s appointment (53.8 %), participation in forums or self help groups (48.4 %) and ordering medicines or other health/illness related products (38.6 %) were less often performed. Table 5 also summarizes possible consequences of health related information found on the Internet and illustrates that such information most often led to either the willingness to change one´s diet or life style (48.7 % of the health Internet users), or to suggestions/queries about a diagnosis or treatment from a health professional (48.5 %). Also it quite often led to feelings of reassurance or relief (43.7 %). Feelings of anxiety (18.8 %), making, cancelling or changing a doctor´s appointment (10.6 %) or changing ones

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Table 2 The relative frequencies before and after weighting

	Observed sample	Weighted sample
Gender		
men	40.3 %	50.3 %
women	59.7 %	49.7 %
Age		
15–24 years	17.5 %	12.3 %
25–44 years	40.1 %	37.3 %
45–64 years	28.7 %	32.6 %
65–80 years	13.7 %	17.8 %
Education		
basic school up to 7 years	2.6 %	4.7 %
basic school 8–10 years, secondary school	84.7 %	62.7 %
short-cycle higher education	5.6 %	7.5 %
long and very long cycle higher education	7.1 %	25.2 %
No of children <18 years of age in the household		
none	58.4 %	61.7 %
1	17.1 %	16.3 %
2	18.2 %	15.9 %
3	5.4 %	5.2 %
4 or more	0.9 %	1.0 %
Residence		
main city (>100,000 inhabitants)	25.4 %	29.1 %
small city (20,000–100,000 inhabitants)	32.4 %	31.9 %
villages (10,000–20,000 inhabitants)	21.2 %	20.2 %
rural area (<10,000 inhabitants)	21.9 %	18.9 %
Occupation		
paid work	48.8 %	52.6 %
in education, unemployed, retired and others	51.2 %	47.4 %
Subjective present state of health		
very good	18.8 %	19.1 %
Good	52.9 %	52.2 %
fair	23.4 %	24.1 %
bad	4.5 %	4.2 %
very bad	0.4 %	0.4 %
Long term illness or disability		
yes	20.4 %	20.0 %
no	79.6 %	80.0 %
Internet user		
every day	34.7 %	42.2 %
every week	22.4 %	21.2 %
every month	7.3 %	5.8 %
less than once a month	4.5 %	3.1 %
never	31.1 %	27.7 %
Internet use for health related purpose conditional on Internet user (unconditional)		
every day	2.4 % (1.7 %)	2.1 % (1.5 %)
every week	9.8 % (6.8 %)	9.3 % (6.7 %)
every month	22.5 % (15.5 %)	24.5 % (17.7 %)
every six months	21.1 % (14.5 %)	22.2 % (16.0 %)
every year	8.3 % (5.7 %)	9.1 % (6.6 %)
less than once a year	6.4 % (4.4 %)	6.4 % (4.6 %)
never	29.5 % (20.3 %)	26.5 % (19.1 %)
Importance of Internet as information source for health related purpose		
strongly agree	30.6 %	16.1 %
agree	11.5 %	21.6 %
neither agree nor disagree	20.2 %	22.0 %
disagree	20.8 %	12.1 %
strongly disagree	16.9 %	28.2 %

Frequency	percentage from complete sample		percentage from Internet users	
		Kumulierte Prozentzahl		Kumulierte Prozentzahl
Every day	1.5 %	1.5 %	2.1 %	2.1 %
Every week	6.7 %	8.2 %	9.3 %	11.4 %
Every month	17.7 %	25.9 %	24.4 %	35.8 %
Every six months	16.0 %	41.9 %	22.2 %	58.0 %
Every year	6.6 %	48.5 %	9.1 %	67.1 %
Less than once a year	4.6 %	53.1 %	6.4 %	73.5 %
Never				26.5 %

Table 3 Frequency of health related internet usage as percentages from the complete sample and the Internet users respectively

a) Internet use for health related purposes: Logistic regression models:

Factor	Main effects model		Model with interaction terms	
	Parameter estimate	Pr > Chi-square	Parameter estimate	Pr > Chi-square
(Intercept)	–0.03	0.86	0.66	0.01**
Gender (female)	–0.23	0.11	–0.51	0.03*
Health (good)	–0.26	0.10	–0.35	0.24
Age (45–80)	–1.18	<.001***	–2.03	<.001***
Children (1+)	0.14	0.36	–0.62	0.01*
Occupation (yes)	0.51	<.001***	0.002	0.99
Education (high)	0.57	0.01**	0.96	0.003**
Urbanisation (urban)	0.35	0.01*	0.18	0.26
Long-term illness (yes)	0.45	0.01*	–	–
Gender:Health			0.68	0.05*
Gender:Children			0.60	0.04*
Gender:Education			–0.75	0.09
Age: Health			–0.65	0.06
Age: Children			1.05	0.002**
Age: Occupation			1.23	<.001***
Long-term illness: Urbanisation			0.86	0.02*

* p < .05; ** p < .01; *** p < .001; dashes indicate „not applicable."

Table 4 Multiple logistic regression analysis. Effects and p-values for additive null model. Moreover, the resulting model allowing for interaction terms after applying stepwise variable selection (R function stepAIC) is given

medicine without any further consultation of a health professional (5.5 %) were much less often.

Subjects were further asked to rate the importance of several aspects of a health related web site. Among the options given, timely and updated information was rated with highest importance (on average 4.54 on a five point Likert scale) followed by secure handling of personal information (4.49) and the fact that it provided information in their own language (4.11). The fact, that a health professional was involved in a web site (3.80) or that it provides interactivity, such as question-and-answer service, discussion groups or chat (2.97) were still rated important, but of lower importance than the first three aspects.

Only 5.8 % of the complete sample (10.9 % of the health Internet users) had ever used the Internet to directly approach their family doctor or a medical specialist. 3.8 % of the sample had accessed their own electronic medical record, 2.2 % had requested or renewed a prescription online and 1.7 % had scheduled an appointment online. Only 0.2 % had ever read a practice web site and even less (0.1 %) had ever asked a health related question over the Internet. Among the reasons for not using the Internet to approach their family doctor worries about confidentiality (81.9 % of the health Internet users who had never approached their physician via the Internet), the fact that their family doctor or specialist did not offer such services (45.7 %), or that they preferred face-to-face communication (34.8 %) were most often stated.

Independent of their Internet use, every subject was asked to rate the importance of several sources of health information

b) Assessment of the importance of Internet as information source for health related purposes: Logistic regression models:

Factor	Main effects model		Model with interaction terms	
	Parameter estimate	Pr > Chi-square	Parameter estimate	Pr > Chi-square
(Intercept)	0.40	0.03*	–0.02	0.93
Gender (female)	0.14	0.31	0.55	0.03*
Health (good)	–0.05	0.74	–0.52	0.03*
Age (45–80)	0.92	<.001***	1.90	<.001***
Children (1+)	–0.22	0.15	0.13	0.59
Occupation (yes)	–0.31	0.03*	0.11	0.54
Education (high)	–0.18	0.38	–0.42	0.32
Urbanisation (urban)	–0.08	0.59	–0.07	0.71
Long-term illness (yes)	–0.06	0.73	0.49	0.13
Age: Gender			–0.83	0.02*
Gender:Education			v0.45	0.04
Gender: Children			–0.58	0.06
Age: Occupation			–0.91	0.003 **
Health (good): Urbanisation			0.80	0.02 *
Long-term illness: Occupat.			–0.57	0.11
Education (high):Urbanisation			–0.72	0.12
Education (high): Long-term illness			0.94	0.10
Long-term illness:Urbanisation			–0.67	0.06

* p < .05; ** p < .01; *** p < .001; dashes indicate „not applicable."

c) Internet use: Logistic regression models:

Factor	Main effects model		Model with interaction terms	
	Parameter estimate	Pr > Chi-square	Parameter estimate	Pr > Chi-square
(Intercept)	1.30	<.001**	1.95	<.001***
Gender (female)	–0.66	<.001***	–0.90	0.002**
Health (good)	–0.41	0.02*	–0.37	0.05
Age (45–80)	–1.86	<.001***	–3.62	<.001***
Children (1+)	0.47	0.02*	0.44	0.25
Occupation (yes)	1.19	<.001***	0.63	0.10
Education (high)	0.78	0.01**	2.03	<.001***
Urbanisation (urban)	0.39	0.02*	0.81	0.001**
Long-term illness (yes)	0.01	0.97	–	–
Age: Gender			0.64	0.10
Gender:Education			–1.01	0.12
Age: Children			1.81	<.001***
Age: Occupation			1.54	<.001***
Children:Occupat.			–0.83	0.05
Children:Urbanisation			–0.67	0.07
Education:Urbanisation			–1.01	0.12

* p < .05; * p < .01; *** p < .001; dashes indicate „not applicable."

Table 5 Health activities and their consequences

Type of health related Internet activities	percentage from health Internet users
find health information AFTER an appointment with health professionals (e.g. for second opinion)	66.2 %
find health information that helped to decide whether to consult a healthcare professional	65.0 %
read about health/illness	61.3 %
interact with health professionals they have not met face-to-face	54.2 %
find health information PRIOR to an appointment	53.8 %
participate in forums/self help groups	48.4 %
order medicines or other products related to health/illness management online	38.6 %
Consequences (has health related information from the internet led to any of the following)	
Willingness to change diet/life style habits	48.7 %
Suggestions or queries on diagnosis/treatment	48.5 %
Feelings of reassurance or relief	43.7 %
Feelings of anxiety	18.8 %
Making, cancelling or changing a doctor´s appointment	10.6 %
Changing of medicine without consulting a health professionals	5.5 %

on a five-point Likert scale (1 = not important and 5 = important).

Boxplots of the assignments to the importance of those sources of health related information are shown in Figure 2. Direct face-to-face-contact with health professionals was rated highest (mean = 4.28), followed by family, friends and colleagues (3.57), books, medical encyclopaedias or leaflets (3.57), pharmacies (3.50), newspapers and magazines (3.45), TV/radio (3.41), Internet (2.86) and courses/lectures (2.63).

Fitting an additive logistic regression model, men ($p < 0.001$), people with education higher than high school ($p = 0.01$), people with children in the household ($p = 0.02$), people with paid work ($p < 0.001$), people living in cities ($p = 0.02$), people who reported to have not a good or very good health status ($p = 0.02$) were more likely to have used the Internet at all as compared to their counterparts (Table 4c: main effects model). People between 45–80 years of age ($p < 0.001$) were less likely to have used the Internet.

Adding interaction terms in the model for gender and age, gender and education, age and children, age and occupation, children and occupation, children and urbanisation, education and urbanisation we observed positive significant overall effects of people with education higher than high school ($p < 0.001$) and people living in cities ($p = 0.001$), positive significant interaction effects between age group 45–80 years of age and with children in the household ($p < 0.001$) and the interaction between age group 45–80 years of age and with occupation ($p < 0.001$), but we obtained negative significant overall effects of gender female ($p = 0.002$) and of people between 45–80 years of age ($p < 0.001$) (table 4c: Model with interaction terms). Figure 3 shows the analysed factors in a classification tree, which is based on age, the interaction between occupation and age group 45–80 and the second order interaction between people with children in the household, people without paid work and age group 45–80.

Discussion

The national survey conducted in Germany in October 2005 showed that almost three quarters of the German population between 15 and 80 years used the Internet (72.3 %), with almost three quarters of the Internet users reportedly looking for online health related information. The number of Onliner thus is higher than those reported by other actual German surveys on Internet use in general (58.2 % Onliner in (TNS Emnid 2006) und 59.5 % Onliner in (Van Eimeren & Frees 2006)). The percentage of Internet use for health related purposes among the Onliner group is also much higher than previously reported (53 % in Hüfken et al. 2004). This may relate to the skewedness of our population in age, gender and education, but also to the fact, that in contrast to the other studies we had limited our population to citizens being younger than 80 and further, that Hüfken et al. had reported on a survey which was already performed in 2001. Nevertheless, it illustrates an increase of Internet use in general and an even more increasing number of health related activities among all Internet users (from 53 % of the Internet users in 2001 to 73.5 % in 2005).

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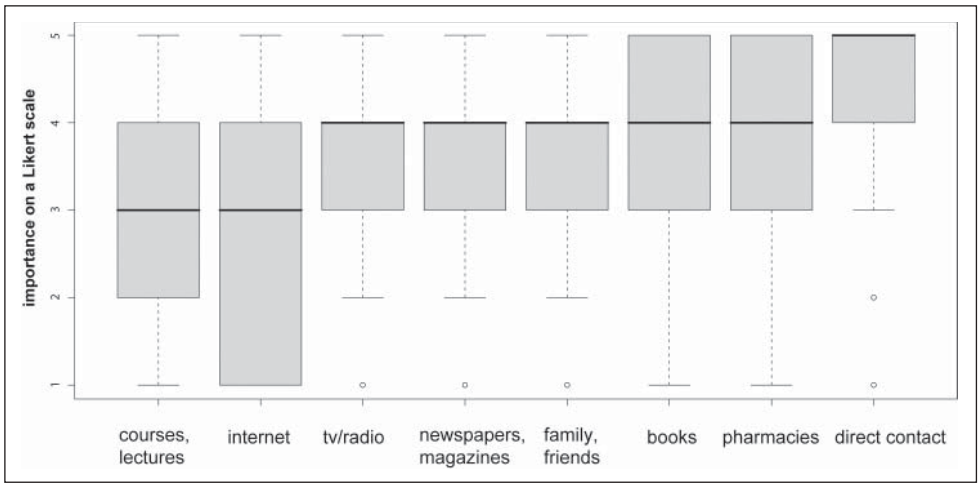

Figure 2 Boxplots of the importance assigned by healthcare consumers to different sources of health information.

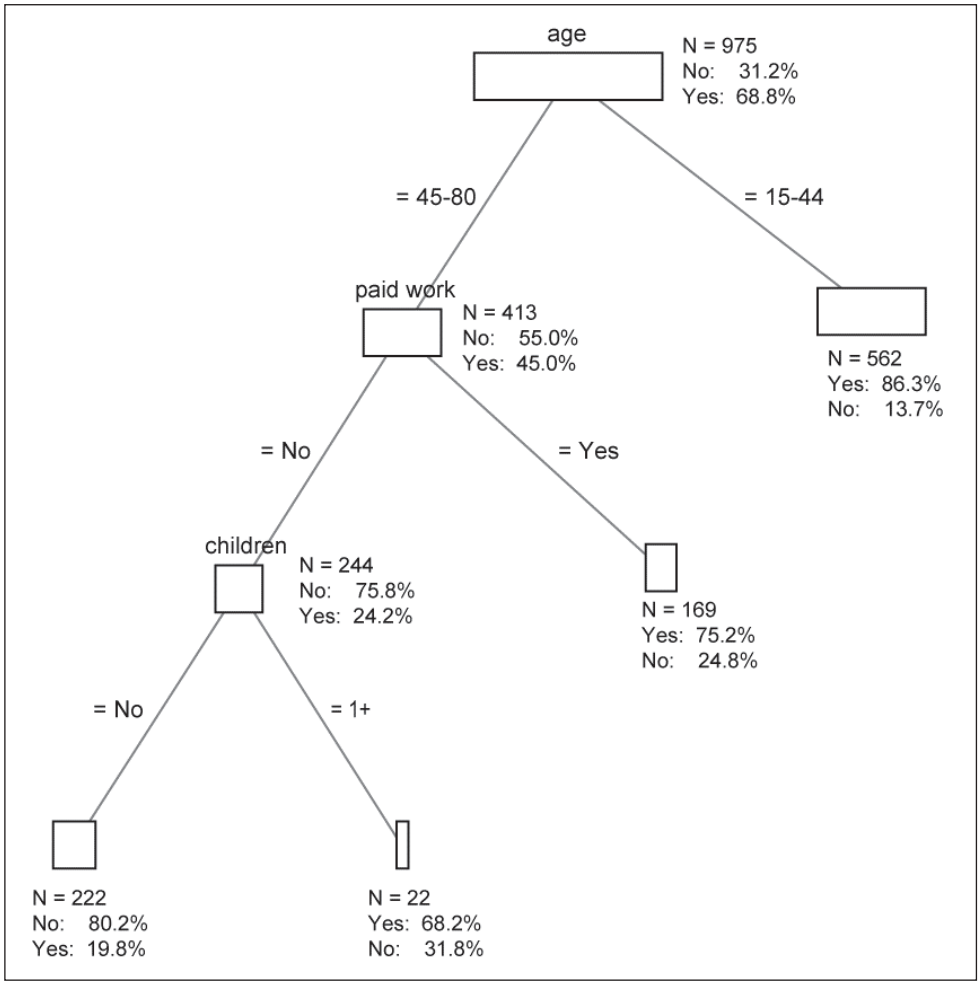

Figure 3 Internet use: Classification Tree. At each node the size of the subgroup and the frequencies of Internet users and non-users are given.

In terms of general Internet use similar findings have been recently reported from an US survey conducted in 2003 (Ybarra & Suman 2006) were 73 % of the sample had reported to be Internet users. However, this US study had found a much smaller rate of health Internet users among all Internet users (only 56 % compared to 73.5 % in our study) than we did. Overall, despite their high rate of internet use, German consumers rated the importance of internet as a source of health

related information amongst the lowest, in comparison with how they rated other sources for such information (only the second lowest, after courses and lectures). Each of the demographic groups considered, rated the Internet as one of the least important sources relative to other sources of health related information (Fig. 2). Our survey revealed that only the Internet users who reported seeking health related information online deemed the internet as a somewhat important source of such information (an average rating on a five point Likert scale >3) while the direct contact with a healthcare professional was rated by far as the most important source of health related information.

This means that Germans find the Internet a convenient way to which they often resort for quickly finding health related information. However, since they generally rate the importance of the Internet as a source of health related information rather low, they probably do not give so much credit to the health related information from the Internet and they may consider that information only for the purpose of orientation.

These findings are in line with two surveys published in the US (Pennbridge et al. 1999; Hesse et al. 2005). One of these surveys showed that most of the people seeking information about cancer "will go first" in the Internet rather than directly going to healthcare providers (Hesse et al. 2005). Nevertheless, the other survey showed (similar to our results), that Internet was only ranked as the fifth (from six) "most useful" sources of health information" (after physicians/healthcare provider, family member, telephone advice line, employee assistance program, newspapers/magazine/journal article, advice book) by both the overall sample and by those using the Internet and only health fairs were rated as less important than the Internet (Pennbridge et al. 1999).

Younger citizens and people with paid work used the Internet more frequently for health related purposes than their counterparts. In contrast to this however, this subgroup assessed the Internet as less important for health related purposes than their counterparts.

Direct face-to-face contact with healthcare professionals was rated as the single most important source of health information relative to the other sources considered, independent from any demographic classification (Fig. 2).

This finding is in line both with results from the older Californian survey (Pennbridge et al. 1999) which showed that physicians were the single most important source of health information for all groups irrespective of gender, ethnicity/race, age, or annual income, and with those of the US "first health information national trends survey", performed in 2003, which also deemed physicians as the most highly trusted information source to patients (Hesse et al. 2005).

Thus, even though our current German survey, as well as the Robert-Koch-Institute´s 2003 health survey (Ellert et al. 2006) and three other surveys conducted in the US between 1999 and 2005 (Pennbridge et al. 1999; Baker et al. 2003; Ybarra & Suman 2006), showed that the use of the internet by healthcare consumers is on the rise and so is its use for seeking health related information, this does not yet translate into changes of the way German consumers perceive the importance of more traditional sources of health related information.

Considering this, and the fact that in our study looking up health information after an appointment with health professionals (e. g. for second opinion) was the most common and looking for information in order to decide whether to consult a healthcare professional was the second common online activity of health Internet users (66.2 %, respectively 65.0 %), physicians should consider the Internet as a very important future means for empowered patients to complement the information they had received directly from their doctor.

More direct online interactions however (e. g. making an appointment or renewing a prescription), at least currently seem not to be of such importance to German patients (only 5.8 % of our sample had ever performed such activities) and worries about confidentiality were the most important reason for not using e-mail (81.9 %), which is again in line with American surveys (Baker et al. 2003; Hesse et al. 2005). Nevertheless, considering the increasing number of US publications about pilot studies on this issue (Leong et al. 2005; Hussain et al. 2004; Katz & Moyer 2004) it is worth monitoring this trend as increases of patient-initiated e-mail will undoubtedly signal accompanying changes in office management practices.

Acknowledgments

The data reported in this paper is part of the project "WHO/European survey on eHealth consumer trends", funded by the European Commission. Seven countries participate in the project; lead partner is the Norwegian Centre for Telemedicine (NST).

We are grateful to Andreas Kröner and Martin Ross for their support in preparing the figures of the article.

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